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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/838,712	04/19/2001	Xiuhong Sun	32308	8805
29669	7590	11/05/2004	EXAMINER	
PEARSON & PEARSON, LLP			GENCO, BRIAN C	
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2615
DATE MAILED: 11/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/838,712

Applicant(s)

SUN, XIUHONG

Examiner

Brian C Genco

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 29 and 38 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for cropping to a resolution of 1520 x 1140 x 4 as described on page 25, lines 5-8, does not reasonably provide enablement for 1532 x 1150 x 4 resolution.

The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-27, 29-38, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over ("COMPUTERIZED AIRBORNE MULTICAMERA IMAGING SYSTEM (CAMIS) AND ITS FOUR-CAMERA APPLICATIONS*", authors Xiuhong Sun, James Baker and Richard Hordon, Presented at 3rd International Airborne Remote Sensing Conference and Exhibition, July 7-10, 1997, Copenhagen, Denmark, pp. II-799 to II-806.), herein Sun, in view of (USPN 5,541,653 to Peters et al.).

In regards to claim 1 Sun discloses an imaging system comprising:

means for providing multispectral bands of images (e.g. the four camera's provided with four bands of filters; section 4.1 on pp. II-803);

a computer connected to said multispectral bands of images for receiving said multispectral bands of images (e.g., sections 1 and 2 on pp. II-799 – II-801; Fig. 1);

means for storing said multispectral bands of images (e.g., the storage is inherent in the PC computer).

Sun does not disclose nor preclude means within said computer for resampling-up said multispectral bands of spectral; means for performing multispectral band-to-band pixel registration of said resampled-up images.

Peters discloses providing four images sensors offset from each other with a spectral band on each sensor and resampling-up said multispectral bands of spectral so that more dense spatial information is gathered by the sensors (e.g., Fig. 18B and 18C; column 23, line 38 – column 24, line 23; column 24, lines 31-34); and

means for performing multispectral band-to-band pixel registration of said resampled-up images such that a representation of each band is present at each location (e.g., column 24, line 37 – column 25, line 32).

Therefor it would have been obvious to one of ordinary skill in the art at the time of the invention to have added Peters offsetting of the image sensors and resampling-up said multispectral bands of spectral so that more dens spatial information is gathered by the sensors and further to utilize Peters multispectral band-to-band pixel registration such that a representation of each band is present at each location.

In regards to claim 2 Examiner notes that in the combination the resampled-up, registered images would be stored in Sun's computer.

In regards to claim 3 note that 4 cameras are utilized.

In regards to claim 4 note that Sun discloses the use of the Sony XC-75 or the Sony XC-8500CE with an interline transfer readout on the bottom of pp. II-800. Examiner notes that Applicant discloses the Sony XC-8500CE is a black-and-white progressive scan CCD with 782 x 576 pixel resolution on page 13, lines 17-19.

In regards to claim 5 note that Sun discloses the use of the Sony XC-8500CE on the bottom of pp. II-800. Examiner notes that Applicant discloses the Sony XC-8500CE is a black-and-white progressive scan CCD with 782 x 576 pixel resolution on page 13, lines 17-19.

In regards to claim 6 see Examiners notes on the rejection of claim 1.

In regards to claim 7 Examiner notes section 4.1 on pp. II-803.

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In regards to claim 8 Examiner notes that Sun discloses utilizing blue, green, red, and near infrared filters in section 4.1 on pp. II-803. Further, Examiner notes that the Sony XC-75 or the Sony XC-8500CE utilize interchangeable filters.

In regards to claim 9 see column 24, lines 25-43 of Peters.

In regards to claims 11-13 see Examiners notes on the rejection above.

In regards to claim 14 note that Peters discloses resampling-up comprises a routine for performing a neighbor average interpolation (e.g., column 24, lines 44-65; Fig. 8a).

In regards to claims 15-18, 20-27, and 31-37 see Examiners notes on the rejections above.

In regards to claims 10, 19, 30, and 40 Examiner notes that it is extremely well known to obtain a bracket of images at multiple exposures in order to extend the dynamic range of an image. Official Notice is taken. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have obtained a bracket of images at multiple exposures in order to extend the dynamic range of an image if necessary.

In regards to claims 29 and 38 Examiner notes that in performing the offsetting and interpolating of the four Sony XC-8500CE sensors it would result in a 1564 x 1152 x 4 bands format. Further, Examiner notes that it is extremely well known in the art to crop images in order to obtain an image of a desired size such that transmission of the image data over limited bandwidth is possible. Official Notice is taken. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have cropped the images in order to obtain

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an image of a desired size such that transmission of the image data over limited bandwidth is possible if necessary. As such, Examiner notes that it would have been within the level of one skilled in the art at the time of the invention to have cropped the images to 1532 x 1150 x 4 bands such that transmission of the image data over limited bandwidth is possible if necessary.

Claims 28 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over ("COMPUTERIZED AIRBORNE MULTICAMERA IMAGING SYSTEM (CAMIS) AND ITS FOUR-CAMERA APPLICATIONS*", authors Xiuhong Sun, James Baker and Richard Hordon, Presented at 3rd International Airborne Remote Sensing Conference and Exhibition, July 7-10, 1997, Copenhagen, Denmark, pp. II-799 to II-806.), herein Sun, in view of (USPN 5,541,653 to Peters et al.) in view of (USPN 6,526,430 to Hung et al.).

In regards to claims 28 Peters discloses the method of claim 20 wherein said step of performing said resampling-up operation comprises the steps of:

redistributing the sensed data of each of said bands of images by filling odd rows/columns with existing data and even rows/columns with zeros (e.g., As shown in Fig. 18B of Peters the green color plane shown as element 813a is redistributed by filling in zeros on even rows/columns of the green color plane as shown in element 813d);

calculating an interpolated value of the pixel data (e.g., column 24, lines 37-43);

copying said interpolated value into an even row/column between said adjacent odd row/column (e.g., column 24, lines 37-65).

Peters does not disclose nor preclude that the interpolation is performed by calculating an average value of the pixel data at every adjacent odd row/column.

Hung discloses to perform interpolation by calculating an average value of the pixel data at every adjacent odd row/column (e.g., column 21, line 40 – column 22, line 18 and Figs. 20-22). Examiner notes that Hung discloses that this interpolation technique is a simple interpolation. Examiner notes that the interpolation of Peters is much more complicated by having to perform local averages and comparisons, many more processing steps are performed. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the interpolation method of Hung since this interpolation technique is a simple interpolation and would require less processing than the method of Peters interpolation. Examiner further notes the equivalence of performing either interpolation technique for resampling multispectral images and the selection of any of these known equivalents would be within the level of ordinary skill in the art at the time of the invention.

In regards to claim 39 see Examiners notes on the rejections above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian C. Genco who can be reached by phone at 703-305-7881 or by fax at 703-746-8325. The examiner can normally be reached on Monday thru Friday 8:30am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Christensen can be reached on 703-308-9644. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the customer service office whose telephone number is 703-308-4357.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian C Genco
Examiner
Art Unit 2615

November 1, 2004



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